ISSN (print) 0093-4666 © 2010. Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

DOI: 10.5248/114.67

Volume 114, pp. 67–70 *October–December 2010*

New records of smut fungi. 2. *Anthracoidea arnellii* sp. nov.

Cvetomir M. Denchev[1*], Teodor T. Denchev[1] & Igor V. Karatygin[2]

cmdenchev@yahoo.co.uk & tdenchev@abv.bg
[1]Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences
2 Gagarin St., 1113 Sofia, Bulgaria

ikar34@yandex.ru
[2]Komarov Botanical Institute, Russian Academy of Sciences
2 Prof. Popov St., 197376 St Petersburg, Russia

Abstract — A new smut fungus, *Anthracoidea arnellii* on *Carex arnellii,* is described and illustrated from Russia.

Key words — *Anthracoideaceae,* taxonomy, *Ustilaginomycetes*

Introduction

A specimen of *Carex arnellii* from the Altai Mts (West Siberia), Russia was found to be infected by an undescribed species of *Anthracoidea* smut fungus. *Carex arnellii* is a member of the sect. *Silvaticae* Rouy, which includes nine species and subspecies from Europe, Asia, and North Africa. *Carex arnellii* is distributed in the European part of Russia, West and East Siberia, the Russian Far East, northern Mongolia, NE China, and the northern part of the Korean Peninsula (Egorova 1999). The species of *Anthracoidea* are restricted to host plants belonging to the same or closely related sections of *Carex.* No species of *Anthracoidea* has previously been reported on a representative of sect. *Silvaticae.*

Material and methods

Material from the herbarium of Komarov Botanical Institute, Russian Academy of Sciences, St Petersburg (LE) was examined under light microscope (LM) and scanning electron microscope (SEM). For LM observations, the spores were

*Author for correspondence

mounted in lactophenol solution on glass slides, gently heated to boiling point, and then cooled. The measurements of spores are given in the form: min–max (mean ± 1 standard deviation). For SEM, the spores were attached to specimen holders by double-sided adhesive tape and coated with gold with an ion sputter. The surface structure of spores was observed at 10 kV and photographed with a JEOL SM-6390 scanning electron microscope.

Taxonomy

Anthracoidea arnellii Denchev, T. Denchev & Karatygin, **sp. nov.** Figs 1–4

MycoBank MB 518336

Sori in ovariis in inflorescentia dispersi, sicut corpora subglobosa, late ellipsoidea vel ovoidea, nigra, 2–3 mm longa, in superficie pulverei. Sporae irregulariter polyangulares, interdum protuberationibus, a fronte visus 16.5–26 × 14.5–20.5 (20.4±1.9 × 17.9±1.5) µm, a latere visus 11.5–13.5 µm, rufobrunneae; paries inaequaliter incrassatus, 1–2.5 (–3) µm crassus, plerumque 1–3 (–4) gibberis internis, et raro etiam maculis lucem refringentibus; superficie verruculosa.

Holotype: On *Carex arnellii* Christ: RUSSIA, Altai Republic, the Altai Mts, near Teletskoe Lake, valley of Chiri River, 3 August 1985, leg. I.V. Karatygin (LE 68 682).

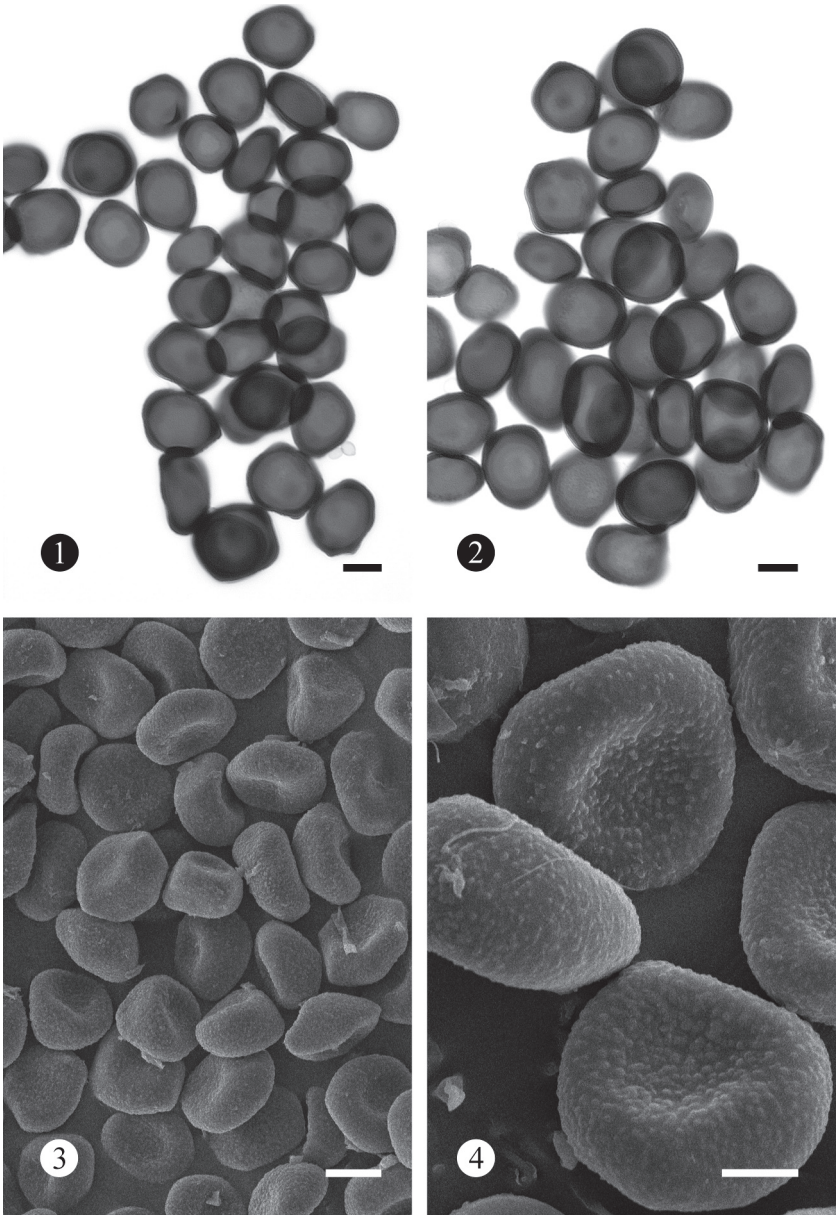
Etymology: the name refers to the host species.

Sori in ovaries, scattered in the inflorescence, as subglobose to broadly ellipsoidal or ovoid, black, hard bodies, 2–3 mm long, when young covered by a thin, silvery membrane; later becoming exposed but partly hidden by the glumes; mature sori powdery on the surface. Spores irregularly polyangular, sometimes with protuberances, in plane view 16.5–26 × 14.5–20.5 (20.4±1.9 × 17.9±1.5) µm (n = 50), in side view 11.5–13.5 µm thick, reddish brown; wall unevenly thickened, 1–2.5 (–3) µm thick, thickest at the angles and protuberances, with 1–3 (–4), distinct internal swellings, rarely with light-refractive areas, verruculose. Germination unknown.

Distribution — On *Cyperaceae: Carex* (subgen. *Carex,* sect. *Silvaticae*), Asia (West Siberia, the Russian Far East).

Comments — On *Carex arnellii,* Kawai & Ôtani (1931: 230) reported *Anthracoidea* sp. (as "*Cintractia caricis*") from Sakhalin (the Russian Far East; collected on 23 July 1930 by E.C. Higashi-Taraika). Unfortunately, there is no information if this specimen is kept in any Japanese herbarium.

Anthracoidea arnellii possesses irregularly polyangular spores with distinct internal swellings like *A. capillaris* Kukkonen but the spores of the latter are smaller. *Anthracoidea capillaris* is known to attack only *Carex capillaris* L. In older taxonomic schemes, *Carex arnellii, C. sylvatica* Huds., and *C. capillaris* were included in sect. *Strigosae* Christ (Chater 1980). In recent taxonomic schemes (e.g., in Egorova 1999), the three species are treated as members of two different, non-related sections: *C. arnellii* and *C. sylvatica* in *Silvaticae,*



Figs 1–4. Spores of *Anthracoidea arnellii* on *Carex arnellii* (holotype).
1–2. In LM. 3–4. In SEM. Scale bars: 1–3 = 10 μm, 4 = 5 μm.

and *C. capillaris* in *Chlorostachyae* Meinsh. (synonyms: sect. *Hymenochlaenae* subsect. *Capillares* (Asch. & Graebn.) Kük.; sect. *Capillares* (Asch. & Graebn.) Rouy). For *Carex sylvatica* and *C. capillaris,* Hendrichs et al. (2004) found that they "are neither clustered together nor with any other member of section *Hymenochlaenae*" and that the section *Hymenochlaenae* is heterogeneous. Because of these reasons, we consider *Anthracoidea arnellii,* on a member of sect. *Silvaticae,* as a distinct species.

Acknowledgements

We gratefully acknowledge Dr Kálmán Vánky (Herbarium *Ustilaginales* Vánky, Tübingen, Germany) and Dr Roger G. Shivas (Queensland Primary Industries and Fisheries, Australia) for critically reading the manuscript and serving as pre-submission reviewers.

Literature cited

Chater AO. 1980. *Carex* L. 290–323, in T.G. Tutin et al. (eds), Flora Europaea, Vol. 5, Cambridge University Press, Cambridge.

Egorova TV. 1999. The sedges (*Carex* L.) of Russia and adjacent states (within the limits of the former USSR). St. Petersburg State Chemical-Pharmaceutical Academy, St. Petersburg & Missouri Botanical Garden Press, St. Louis. 773 pp.

Hendrichs M, Oberwinkler F, Begerow D, Bauer R. 2004. *Carex,* subgenus *Carex* (*Cyperaceae*) – a phylogenetic approach using ITS sequences. Plant Systematics and Evolution 246: 89–107. doi:10.1007/s00606-004-0128-0

Kawai K, Ôtani H. 1931. A provisional list of fungi collected in Southern Saghalien. Transactions of the Sapporo Natural History Society 11: 227–242.